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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,940	08/31/2001	Hiroshi Koizumi	16869P-030800US	2783

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EXAMINER	
CHOI, WOO H	

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/944,940	KOIZUMI ET AL.	
	Examiner	Art Unit	
	Woo H. Choi	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *6-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 14-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/31/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 16, 17, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. With respect to claims 16 and 17, claim 16 requires reallocation of data when the frequency of access does not satisfy performance parameters that are not comparable to the access frequency, such as I/O accessibility, data transfer volume, free disk space rate, disk busy rate, and an amount of cache resident data. It is not clear what is being claimed since it is not clear how one can determine that the access frequency does or does not satisfy, for example, performance determined by an amount of cache resident data.

Claim 17 depends from claim 16, which is found to be defective as discussed above.

4. With respect to claim 18, the claim recites the limitation "performance requirement parameter indicating system performance **desired** by a contractor". Ordinary meaning of the word desire is "to long or hope for". It is not clear how one can ascertain the metes and bounds of what an unspecified contractor "longs or hopes for". The Examiner notes that what a contractor specifies as a performance requirement is not necessarily what the contractor hopes

for. For the purposes of this examination, the limitation above will be interpreted as any parameter that relates to a desirable system performance characteristic in general.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 – 4 are rejected under 35 U.S.C. 102(e) as being anticipated by DeKoning (US Patent No. 6,275,898).

7. With respect to claim 1, DeKoning discloses a data storage system comprising:

an input part which receives performance requirement parameters concerning storage performance for each of a plurality of data storage areas within the data storage system (col. 11, line 66 – col. 12, line 19);

a first comparing part which compares the performance requirement parameters with actual storage performance variables (figure 10, see also figure 3, 316);

a first detection part which detects at least one data storage area where the actual storage performance variables do not satisfy the performance requirement parameters (320); and

a migration part which migrates data stored in the data storage area detected by the first detection part to another storage area (figure 3, 310, see also figures 9B and 9C).

8. With respect to claim 2, write/read ratio threshold and bandwidths thresholds are averages per unit time.

9. With respect to claims 3 and 4, bandwidth is a measure of data transfer speed.

10. Claims 14 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Obara et al. (US Patent Application Publication No 2002/0194426).

11. Obara et al. disclose a method for allocating data storage area within a system comprising of storage device and storage controller, the method comprising the steps of:

setting performance requirement parameters for the storage controller (figure 5, load unbalance threshold), the performance requirement parameters associated with each of a plurality of data storage areas;

monitoring access frequency for the data storage areas (page 5 paragraph 67); and

reallocating data stored in a data storage area where the access frequency does not satisfy the performance requirement parameters (figure 5).

12. With respect to claim 18, see rejection of claim 14 above. As to the claimed limitation "performance parameter indicating system performance **desired** by a contractor", performance

parameters taught by DeKoning indicate system performance measures that are desirable to storage system users in general, including a contractor, such as access speed.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning in view of Milillo et al. (US Patent No. 5,566,315, hereinafter "Milillo").

DeKoning discloses all of the limitations of the parent claim as discussed above. DeKoning also disclose the following:

creating a mirror disk (see figure 9C, 956);

varying data redundancy (promotion/demotion of RAID level requires this); and

transferring data from one physical volume to another physical volume (956, re-striping to covert RAID level requires this as well) .

However, DeKoning does not specifically disclose staging of data into cache. On the other hand, Milillo et al. disclose a mass storage system with cache memory (figure 1).

It would have been obvious to one of ordinary skill in the art, having the teachings of Milillo and DeKoning before him at the time the invention was made, to use the cache memory

in a mass storage device teachings of Milillo in the mass storage device of DeKoning, in order to reduce access times and improve computer system performance by minimizing the non-productive times when the processor is waiting to read or write data (Milillo, col. 1, lines 46 – 49).

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning in view of Donovan et al. (US Patent No. 6,012,032, hereinafter "Donovan") and alternatively further in view of Conner et al. (US Patent No. 6,816,886, hereinafter "Conner").

DeKoning discloses all of the limitations of the parent claim as discussed above. However, DeKoning does not disclose charging for data storage. On the other hand, Donovan specifically discloses a method of charging for storage in accordance with the level of peformance (col. 1, lines 58 – 67).

It would have been obvious to one of ordinary skill in the art, having the teachings of DeKoning and Donovan before him at the time the invention was made, to use the charging for data storage teachings of Donovan with the data storage system of DeKoning, in order to be able to offer computing and data processing services to customers. One skilled in the art would also have been motivated to adopt Donovan's teachings to be able to account for resource usage by various cost center more accurately for charge-back purposes (Donovan, col. 1, lines 17 – 23).

in a mass storage device teachings of Milillo in the mass storage device of DeKoning, in order to reduce access times and improve computer system performance by minimizing the non-productive times when the processor is waiting to read or write data (Milillo, col. 1, lines 46 – 49).

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning in view of Donovan et al. (US Patent No. 6,012,032, hereinafter "Donovan") or alternatively further in view of Conner et al. (US Patent No. 6,816,886, hereinafter "Conner").

DeKoning discloses all of the limitations of the parent claim as discussed above. However, DeKoning does not disclose charging for data storage. On the other hand, Donovan specifically discloses a method of charging for storage in accordance with the level of peformance (col. 1, lines 58 – 67).

It would have been obvious to one of ordinary skill in the art, having the teachings of DeKoning and Donovan before him at the time the invention was made, to use the charging for data storage teachings of Donovan with the data storage system of DeKoning, in order to be able to offer computing and data processing services to customers. One skilled in the art would also have been motivated to adopt Donovan's teachings to be able to account for resource usage by various cost center more accurately for charge-back purposes (Donovan, col. 1, lines 17 – 23).

Donovan also teaches charging in proportion to the amount of time spent at a specific service level, which is equivalent to the claimed limitation of refunding the charge in proportion to the amount of time not spent in a specified service level.

Conner discloses a method of charging for computing and data processing services to customers that comprises charging for storage service (col. 13, lines 30 – 34). In addition, Conner specifically disclose a method of reducing charges for not meeting specified service levels (col. 10 lines 47 – 52).

It would have been obvious to one of ordinary skill in the art, having the teachings of Donovan, Conner and DeKoning before him at the time the invention was made, to use the SLA teachings of the data service method of Conner, in the data service offering of DeKoning and Donovan in order to enhance product offerings. SLA is a well known concept in service industries and is analogous to a warranty for a manufactured product, which provides a degree of assurance of product/service quality.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamoto et al. (US Patent No. 6446,161), Tabuchi et al. (US Patent No. 5,905,995) and Allen (US Patent No. 5,790,886) disclose other data storage system that reallocates data storage based on performance parameters. Crawford (US Patent No. 6,411,943) disclose a

method of providing data storage services. Mikurak (US Patent No. 6,671,818) disclose a method of providing a service with an SLA with discount based on service level violations.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (571) 272-4179. The examiner can normally be reached on M-F, 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

whc
December 21, 2004

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